A HITCHCOCK PUBLICATION

March 1987

INFOSYSTEMS

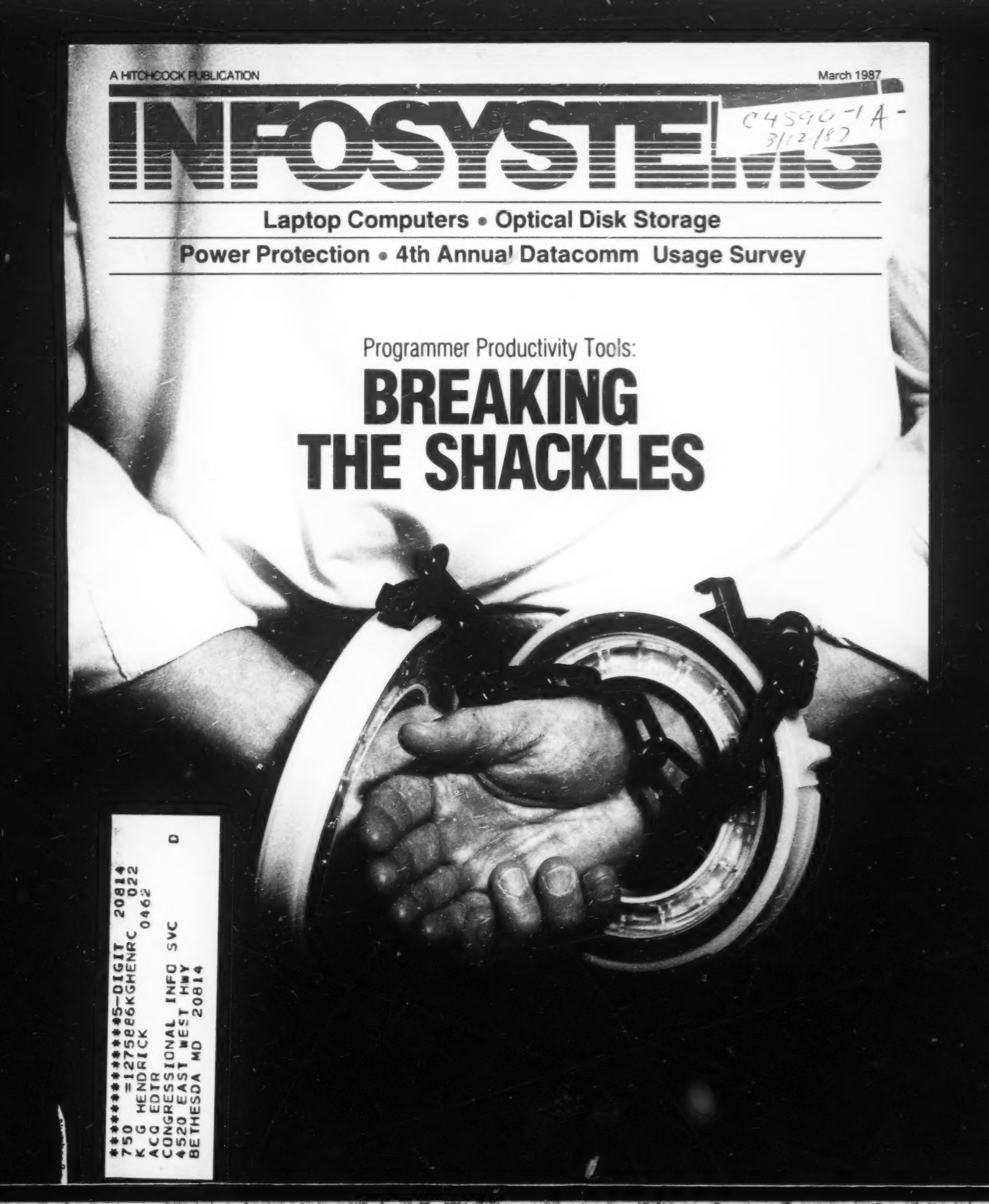
C4590-1A-
3/12/87

Laptop Computers • Optical Disk Storage

Power Protection • 4th Annual Datacomm Usage Survey

Programmer Productivity Tools:

BREAKING THE SHACKLES



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ISSN 0364-5533

INFOSYSTEMS

THE MAGAZINE FOR THE IS MANAGER

March 1987 Volume 34 Number 3

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Telex: 72-0404
MCI Mail 220-0783 Easylink 62608100

One of the
ABC PUBLISHING *Companies*

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1330 Avenue of the Americas
New York, New York 10019

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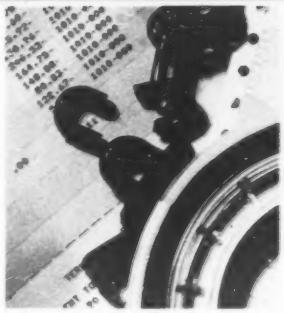

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PROGRAMMER PRODUCTIVITY TOOLS: Breaking the Shackles

Some programmers spend hours laboriously producing code when a few simple tools could release them from their fetters.

■ By Jan Snyders, Senior Editor

Pity the poor programmer: sitting at a terminal from before sun up until the early hours of the next morning; developing, enhancing, modifying programs. More specifically, pity the poor programmer who is unaware of productivity aids. Those individuals are often prisoners of their job, spending hours laboriously producing code when a few simple tools could release them from their fetters.

The size of the potential productivity increase depends on the comprehensiveness of the tools chosen. About 100 different tools are on the market, ranging from a complete development center to workbenches to simple documentation aids. Increase productivity at any stage, and the entire programming cycle is accelerated. Increase productivity at a number of integrated stages, and productivity gains are more substantial.

To aid the development process, for example, Dadsco in Dayton, OH, installed QuickTask from Goal Systems International, Columbus, OH. "Development time is about 65 percent less than that required by CICS command-level programming and 95 percent less for systems programmers," says Rick Schwartz, president of Dadsco. QuickTask functions as both a utility and as a stand-alone application-development aid replacing command-level Cobol.

Other users report substantial increases as well. A Minnesota-based service bureau reduced coding time by about 30 percent using Sourcemanager from MSP, Lexington, MA. One manufacturing firm installed two online development aids and increased programmer productivity 80 percent

over CICS capabilities.

These and other increases are possible given the range of productivity tools available. A look at the uses of these tools--and their benefits beyond raw productivity figures—shows the variety of ways programmers are breaking the shackles.

"We were not adequately responding to our customers," says Dadsco's Schwartz, whose firm provides computer-based management services to wholesale supply houses. "Response time to customers was really key to our survival. The response time in development of new systems and enhancements to current systems was not adequate using Cobol command-level CICS development practices and procedures."

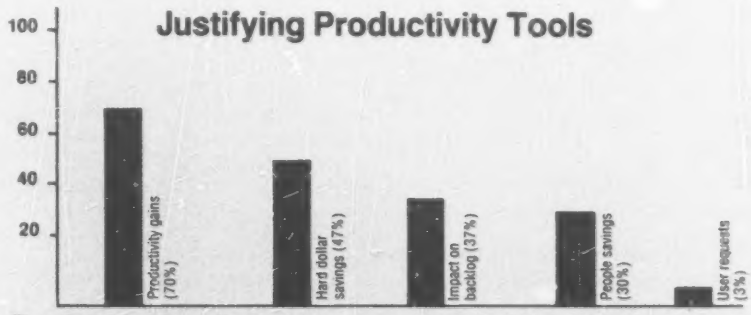
Dadsco's staff of seven programmers uses QuickTask to develop inquiries to file maintenance programs and inventory, financial and order-entry data bases. The staff also employs it as an on-line problem determination and fix program like a batch utility.

In addition to the development time savings mentioned, Schwartz provides good figures on other productivity increases. "When the program is in a debug mode, there is a reduction of 50 percent in debug and test time over programming without QuickTask," he says. "So we get another 25 percent savings in screen design and about 25 percent in the coding itself."

The Help facility built into the product is particularly suited for entry-level programmers, according to Schwartz. It allows them to get help in a specific area or language. Examples and instructions for a particular portion of the language appear on the screen so the programmer doesn't have to look for the reference manual. "This has been helpful not only in getting consistency in the coding," he says, "but it also speeds up the coding itself. The programmers can't remember everything, but they don't have to get up and look for the information."

Sometimes productivity increases on a larger scale are necessary. At the US General Services Administration (GSA) in Falls Church, VA, Richard Harrison, director of the Federal Software Management Support Center, has set up a programmer's workbench (PWB) using the Rand Development Center (RDC) from Rand Information Systems, Alameda, CA. "The center was set up specifically to develop information, methods and techniques for other agencies," says Harrison. "We sell our services and are what is known as a demand-justified, totally reimbursable operation."

GSA started by handling two functions on a common basis for other agencies: validation of compilers and conversion. Several years ago a lot of change took place in the federal government. Conversion was occurring frequently. It was approached in every possible way, both technically and contractually, Harrison recalls. "At that time, software productivity tools were not an issue with us," he says. As clients started asking for more assistance in solving problems, "we found ourselves developing guidelines, tool selection and evaluation [procedures] on a case-by-case basis. We were reinventing the wheel each and every time. That was getting expensive.



The primary question managers must answer is: How much more can I accomplish without increasing my staff? Once that is identified, productivity gains are translated into profit and loss impact (such as cost avoidance or cost savings) to justify the decision.

Source: Dialogic Systems

"We set out to assemble an inventory of productivity tools that we thought would be capable of increasing productivity and reducing cost in our maintenance functions."

GSA settled on IBM hardware because more software tools were available. "The software tool we envisioned would control all the other tools," says Harrison. "We searched for a long time trying to find control. The only thing we were able to come up with in this country that met the specifications was RDC. There were two others but both were hardware driven and we wanted to use our own equipment."

Once RDC was selected, it was necessary to develop a list of software that would run under the PWB. GSA chose 11 functions that would be reasonable for use and specified performance for each. The 11 subsequent tools came from eight vendors.

GSA's Federal Software Management Support Center provides other government agencies with handbooks and brochures containing information about the PWB. Users can buy as much of the service as they want. "We will sell them individual tools for any number of reasons," says Harrison.

In every case where GSA has sold a tool to federal clients without them buying a PWB first, they have come back and bought the PWB. That's because they realize how great it is, asserts Harrison. "Intentionally, the use of tools stresses integrated configuration," he says. "But in the long run, it would have been silly to put a policy out that said you can only buy this package and nothing else. We would have been slamming the door on potential customers who may have come back and purchased quite a bit."

The Rand products used by GSA are an example of a comprehensive, integrated set of tools designed to increase applications-development and maintenance productivity. "The design goals inherent in the RDC productivity aids enhance control of software development and support functions, and increase the quality of applications software," declares Christopher Ehemann, product manager at Rand. "RDC establishes an environment where productivity tools and procedures are supported by interactive, user-friendly dialogues. It provides a controlled and uniform interface for presentation of software tools, utilities and productivity aids. It also enhances user participation in design, testing activities and organizational procedures."

RDC consists of six major component groups: Systems Software Manager (SSM); IDMS applications-development tools; IDMS application-

testing tools; IMS and CICS applications tools; and Software Maintenance Utilities (SMU). SSM provides the umbrella or infrastructure for the organization of all tool sets into workbenches or related groups.

A General Information Facility or bulletin board and a JCL-generation facility enhance usability and expandability of the development center. The IDMS, CICS and IMS application tool sets support system-development activities including dictionary interface and program generation. Automated support for an exacting testing methodology is also provided. The IDMS development and testing tool sets may be acquired together as a package or separately, depending on user requirements.

The CICS and IMS application tool sets rely heavily on a common facility called the Rand Development Dictionary. This generates application-system components such as screen-control blocks and program-copy structures. Similar tools support design and testing activities and data base maintenance. Both tool sets have a full-function, on-line systems architecture to support complete applications program development.

The SMU set provides individually available tools under the SSM which supports software maintenance activities. These activities include system source-code cross-referencing, source-code reformatting, unreferenced source-code analysis, test results verification, percentage-of-execution analysis, and test data extraction and conversion.

A major RDC feature is its modularity. "The infrastructure alone, the SSM which includes the JCL-generation facility, and some program-generation capabilities for developing new tools can be purchased for about $30,000," says Ehemann. "If you acquire what we call an application-development tool set for IDMS, IMS or CICS, it includes the SSM, all the JCL-generation, program-generation and testing facilities, and change-control tracking facilities. That can cost up to $87,000."

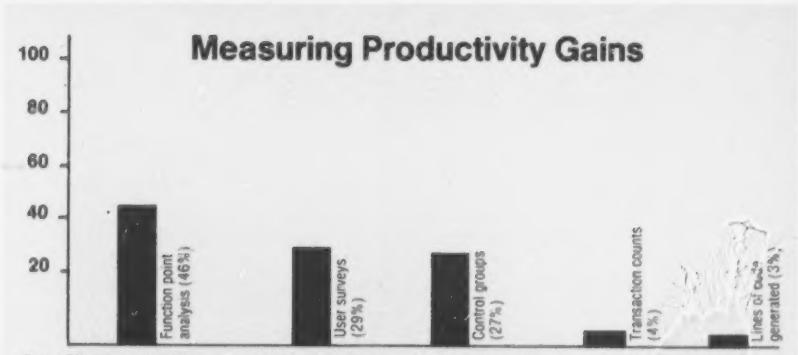
National-Standard in Niles, MI, also reports increased productivity after installing programmer productivity software. The company, an international wire manufacturer that supplies metal fabricating shops with weld and spring wire, faced a large backlog for on-line development. "At the time we were strictly using CICS. [We also] had budget and personnel cuts, and had to let people go. That complicated the backlog problem," says Priscilla Davis, systems analyst.

In order to solve the problem, the company installed UFO and Cobol XE from On-Line Software International, Fort Lee, NJ. Programmers and programmer analysts use these packages for all on-line development. "Programmer productivity has increased approximately 80 percent over what they were capable of doing using CICS," says Davis.

National-Standard developed a massive system: 30 to 60 screens including batch reports and all the analytical work. Because of the increased productivity, it was up within six month's time using only 1½ to 2 people, Davis says.

Instead of a looming backlog, one service bureau used the conversion of mainframe hardware as the impetus for installing productivity tools. Medical Data Reports (MDR), West St. Paul, MN, realized a 30 percent gain after installing Sourcemanager from MSP, Lexington, MA. MDR, a service bureau specializing in debt collection, encountered a problem when it decided to convert mainframe hardware vendors from Sperry to IBM. "Along with that technology change, we had to retrain a lot of people and staff up with new people that had more IBM experience," says Kevin Dinger, manager of technical support.

MDR basically redesigned its entire data processing shop, not wanting to just convert the old system to new. "We wanted to redesign and redevelop, which was a good size project for our company," says Dinger. "We also decided that we were going to start a more regimented way of designing and implementing systems."



Only 69 percent of the survey respondents answered the question about measuring productivity. The results of those who did show that the old mainstay measurements of the 1970s—lines of code generated and transaction counts—have fallen to the wayside in favor of more quantifiable methods such as function point analysis and control groups.

Source: Dialogic Systems

A Survey of Management

While large amounts are spent on software tools for new development, 68 percent of information systems (IS) managers polled in a recent survey said productivity tools used for program maintenance provided the highest returns.

These findings come from a survey of 149 managers of IBM MVS installations from across the US with staff sizes ranging from 25 to 800 programmers. The survey was conducted by Dialogic Systems, San Jose, CA, in conjunction with a series of productivity planning seminars. The charts shown throughout this article are from the survey.

Regarding improved maintenance productivity, managers said maintenance tasks such as program fixes and package modifications can account for anywhere from 55 to 95 percent of their real workload. Although productivity gains in the maintenance area were said to give the most benefit, most managers indicated that their past purchases have predominately been for Cobol and application generators for new development only.

The survey also revealed that 70 percent of the managers found changes to their programmer environment had the most significant impact on productivity. Changes mentioned include consistent response time, one-to-one terminal ratios and the installation of ISPF. Only 30 percent said software tool purchases such as fourth-generation languages and report writers provided a greater benefit. (15)

For more information on the survey, Enter No. 14 on the Reader Information Card.

PROGRAMMER PRODUCTIVITY TOOLS

Dinger says the company looked at code generators but decided they did not fill the bill. One of MDR's goals was to market the redesigned system to other companies. "We wanted that code to look good to other people both visually and performancewise," he explains. "We wanted code to be consistent so that maintenance was a much easier task."

Sourcemanager is tied closely to a data dictionary and data manager. "We are not a data base shop yet," says Dinger "We needed a product that generated Cobol but was not tied to any particular data base methodology. We are using [Sourcemanager] strictly to generate Cobol, not any particular type of Cobol or type of data base attached to Cobol, but just generating the Cobol code."

The Sourcemanager generates about half of the program or the first three divisions of a Cobol program: the environment, identification and data divisions. Those areas of the program are repetitious, but quite time-consuming if a programmer has to code them. "Now programmers can spend the bulk of their coding time coding the procedure division, which is what they are paid to do," says Dinger.

In addition to saving on coding time, companies can gain in other ways. For instance, General Foods, Lafayette, IN, reduced staff after installing Manage/38 from BMS, Oak Brook, IL. According to Wayne Hilt, senior systems analyst and operations supervisor for the food manufacturing and distribution company, the primary reason for looking for new software was to solve the night-shift backup problem.

"It was difficult to attract and keep good-quality people on the third shift," says Hilt. "When we found the package to solve that problem, we found it had other benefits, such as being able to better coordinate and control program development, and better utilization of job logs."

Priscilla Davis, Systems Analyst
National-Standard, Niles, MI

"Programmer productivity has increased approximately 80 percent over what they were capable of doing using CICS."

Manage/38 is used as a job-log management system. Now if a programmer has to find a job log, it is searched for by job, user, or time. That makes it easy to find. Under the old system job logs were printed by day and filed in a vault, making it cumbersome to locate what you wanted.

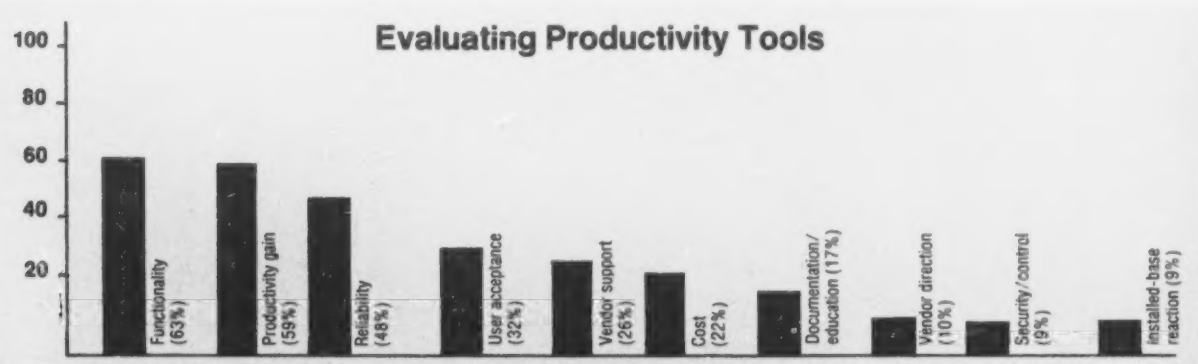
The system is also used for automatic job submission. "We have several jobs that we run every day," Hilt says. "We just schedule those jobs at whatever time we want them to run. Then, when that time comes around, the job is automatically executed."

Hilt mentions other benefits. "We have better control over program development," he says. "We know exactly what phase that the particular program is in, whether it has been put into production or where it is in the process. We were able to reduce operations staff since installing the package. We have also found that users can generate their own on-line Help tactics rather than have systems people generate and write them in systems terminology."

In addition to saving time, another way to judge the benefits of a software package is by the length of time it takes to pay for itself. Commerce General, Memphis, TN, is a subsidiary of the National Bank of Commerce that does financial data accounting. Before installing Condor from Phoenix Software, Los Angeles, it had a card data-entry system for updating source modules. The company needed much faster turnaround and got it because Condor is an on-line system.

"You [shouldn't] have a data-entry department where you have to wait a day or a day and a half to get source code changes back from the keypunch area," says William Burgett, vice president of systems at Commerce General. With Condor, the programmers all have their own terminals and everything is entered on-line, greatly improving productivity. As for the monetary payback, Burgett says, "We really have not put a cost estimate on savings but we figured it paid for itself in two weeks." (15)

For a list of programmer productivity aid software products, their vendors and the equipment they run on, enter No. 13 on the Reader Information Card.



The top four justification criteria for evaluating productivity tools address four key questions: Does the solution actually address the problems in my workload that I need help with? Does the gain in accuracy and speed cost-justify the purchase? Is the reliability, availability and service level consistent with my expectations? Am I convinced my programmers will continue to use the tool after purchase?

Source: Dialogic Systems

4th-Annual Datacomm Usage Survey

Incoherent Communications

Confusion reigns in the communications realm where companies try to build networks out of disparate parts furnished by "finger-pointing" suppliers.

By Wayne L. Rhodes Jr., Editor and Ray Winkler, Manager, Market Research

The breakup of AT&T several years ago continues to be a bone of contention among users of communications equipment and services. What was once a seemingly comprehensible nationwide communications network now apparently borders on being an incoherent mix of crossed wires. Numerous respondents to INFOSYSTEMS' fourth-annual survey of data communications usage complain about either the divestiture itself or the frustration of trying to get AT&T to cooperate with its offspring, the Regional Bell Operating Companies (RBOCs).

Most of the RBOCs are mentioned in responses to a question about problems encountered with the installation and use of datacomm equipment. No matter what you call them—the telephone company, telco, local Bell operating company—RBOCs are referred to frequently. Complaints range from the aforementioned unwillingness to cooperate

Products and Services

	Currently use	Plan to add in next 12 months
Terminals	93%	28%
Modems	94%	29%
Printers	93%	25%
Microcomputers	84%	26%
Communications software	73%	22%
Micro-to-mainframe links	60%	36%
Private line	48%	11%
Communications processors	45%	11%
Multiplexors	50%	19%
PBXs: voice	47%	5%
Carrier (common, value-added packet switching)	39%	12%
Converters (protocol interface, etc.)	41%	20%
Diagnostic and test equipment	31%	8%
Local area networks	32%	38%
Network management systems	21%	17%
PBXs: voice and data	13%	13%
PBXs: data	13%	8%
Base	878	417

Expansion Plans of Current Users (Next 12 Months)

Base: 884	Local systems	Metropolitan area systems	Long distance systems
Will expand moderately	37%	13%	21%
Will expand substantially	8%	4%	10%
Will change or replace present systems	10%	3%	6%
No changes planned or no answer	46%	80%	64%

4th-Annual Datacomm Usage Survey

to repeated condemnations of poor line quality. The following two comments are representative: "AT&T breakup is causing problems with lines and equipment to take 300 percent longer to fix." And, "The breakup of AT&T caused delay and confusion in trying to install and get four dedicated tie lines working."

The AT&T divestiture is not the only concern, however. Nearly half of the more than 900 respondents to the survey mention problems. They cite difficulty in resolving problems among multiple vendors; poor documentation; overblown sales claims; and the lack of competent technical expertise. "Equipment does not perform as advertised," writes one person. "The vendor can't decide whether the problem is hardware or software." Another complains that everything looks fine in design, but it takes a long time to make the equipment operational.

INFOSYSTEMS' fourth-annual survey of datacomm usage also indicates how various products and services are faring. For example, two years ago 55.1 percent of the respondents said they planned to add micro-to-mainframe links within the next 12 months. This year that percentage has dropped to 35.7 percent. Conversely, the number of installed links has grown significantly during the period. Where just over 40 percent had links two years ago, nearly 60 percent have them now.

A similar, although not nearly so dramatic change can be seen in the local area network (LAN) arena. Two years ago less than a fourth of the respondents had a LAN; this year almost a third have at least one. The most notable occurrence is that LANs have moved up to number one as the product or service to be added in the next 12 months, displacing micro-to-mainframe links.

Another hot technology of recent years, the microcomputer, appears to have cooled down somewhat. Two years ago, nearly 40 percent of the respondents said they would add micros within the next 12 months. This year just over a fourth say they plan to add micros. That level of expansion puts the micro in the same growth range as three long-time datacomm systems components: printers, terminals and modems.

Two years ago expansion plans were robust, but only modest expansion has actually happened. Datacomm users are being asked to make the core of what they have work more efficiently.

While the video terminal has ranked as the number one installed piece of datacomm equipment in each of the three previous surveys, modems surpass it this year. That leads to speculation that organizations may be using micros instead of terminals in some instances. Consequently, modems are accompanying the micro into installations. Modem use has grown over four percentage points in the past three years, while video terminals have fallen by just under two percent in installed base.

INFOSYSTEMS' survey was conducted during January by Hitchcock Research Services of Wheaton, IL. Respondents were drawn from the circulation of the magazine. The findings are based on responses from 23.3 percent of 4,000 mailed questionnaires. Most of the respondents say they are information systems managers. They were drawn from a cross-section of the magazine's circulation: 18.7 percent work where the entire company is at one location; 57.7 percent work at a company headquarters; and 26 percent are at a branch or division of a larger company.

Only 10 percent of the respondents say that the title of the person responsible for datacomm is the Data Communications Manager. As in past surveys, the function most frequently cited as having responsibility is Data Processing/Information Systems (DP/IS). Three-fourths of the companies report this. In those few companies that do have a Data Communications Manager, that person reports to DP/IS nearly 70 percent of the time.

As might be expected, the larger the company the more likely it is to have a formally designated datacomm manager. Likewise, the more dispersed its operations, the more likely a datacomm manager oversees the network. Thirty percent of the respondents in the transportation and banking fields report having a datacomm manager. Those are the only industries, other than DP services, to report use of the title more than 12 percent of the time.

The most frequently reported communications scheme is a local system either within a building or tying together campus facilities. Almost everyone has a local system in place. The next most frequently reported system is long distance. Over half of the respondents have one and another 9.4 percent expect to expand to that capability within the next 12 months.

Less than a third of the respondents have a metropolitan-area system in place. Not surprisingly, the heaviest use of metropolitan systems is among banks, followed by DP service organizations, and government and military installations. While most industries reported heavy use of long-distance systems, the heaviest users are transportation, DP service organizations and retail.

Types of Data Communications Systems Being Used

	Currently have	Don't have now but plan to add in next 12 months	Total that have or plan to add in next 12 months
Local systems (on-site or neighboring facilities)	83% (764)	5% (44)	88% (808)
Metropolitan area systems	31% (287)	5% (46)	36% (333)
Long distance systems	53% (491)	9% (87)	63% (578)
Total with one or more systems	96% (884)	17% (153)	98% (907)

Expansion plans among users of the various systems is modest at best. Over a third of the local-system users plan to expand moderately within the next 12 months; but 45.5 percent report no plans to change. Eight percent of the metropolitan-area users report no changes ahead; 64 percent of the long-distance users say the same.

Two years ago expansion plans were robust, but only modest expansion in the installed bases for each of the three types of systems has actually happened. It is evident that, unlike micro-to-mainframe links, little has been accomplished. Datacomm users are being asked to make the core of what they have work more efficiently. One respondent says, "Because of multivendor equipment, the diagnosing and problem determination is not integrated. We are addressing network management for the future."

The survey comments show a widespread concern about network management capability. Respondents seem to be more concerned with better management discipline and technical expertise than with getting more new equipment. There is "not one reliable source of information to put an entire network together," according to a respondent. Another decries a lack of information on what is needed on a step-by-step basis from the people who sell the equipment and software.

"The technology is running away before the system is in place," complains a respondent. "The technology is already past us." Another person describes the problem as compatibility, "tying the old to the new, to the newer, to the newest, to the future. It's not just one generation to the next, but multiple generations."

In the interim, datacomm users face a series of perplexing problems. Foremost, "there is too much finger-pointing going on when multiple vendors are used to put together a telecommunications system," says one exasperated respondent. Another declares that the problem is trying to pin down one supplier for the responsibility of downtime.

Manufacturer's specifications are not what they say, reports one user. "The water is so full of sharks," laments another. "It is hard to know exactly what to do at times and many companies promise but don't deliver." Still another person says the documentation of products is a problem: the equipment doesn't operate exactly as promised. And another derides the conflict between intended use and "specified" capabilities. (The quotation marks are the respondent's.)

One person succinctly sums up the source of problems: "deregulation/divestiture." Others have more specific complaints. "The quality of line from Minnesota to Toronto is lousy," says one. "2,400 [baud] just barely makes it." In fact, the quality of available lines is condemned repeatedly. A couple of comments best catch the flavor: "Using voice-grade public phone lines, data moves slowly and is frequently garbled. Also, the carrier is lost at times." The problem is the "downtime of telephone lines and the inability to identify and then have the vendor fix the problem 80 percent of the time. The telephone company is very frustrating and costly."

The so-called telephone company, of course, now has several incarnations. Several of them are mentioned: Wisconsin Bell, NYNEX, Bell of Pennsylvania, Southern Bell. Ironically, each of these is named by respondents as being unable to work amicably with AT&T, their former parent. Lest any other suppliers of communications products and services feel smug about the predicament of the phone companies, they should note that all vendors are castigated for the inability to work with others. Probably the comment that raises an eyebrow the most is the one citing problems with "connecting an IBM mainframe to a Rolm CBX II." (For the uninitiated, IBM bought Rolm a couple of years ago.)

Most consistently, however, the complaints relate to the inability of users to plan and implement datacomm systems. Their problems stem from incompatible products, too many products and "less-than-expert vendor support." One respondent says there is a lack of adequate long-range plans for phase-ins and upgrades.

It should be borne in mind that these complaints come from only half of the survey's respondents. Judging from the number of different functions named as having some sort of responsibility for datacomm, however, you may conclude that the situation is just as incoherent internally as it seems to be externally. Several respondents say their problem is a lack of qualified personnel. One says, "Data communications personnel have little understanding of data processing requirements, such as transparency across multiple hardware channels or nodes."

Trying to pull coherence out of this would vex the most patient and competent among us. Only one thing appears certain: Users want—and are demanding—communications capabilities that rival the old phone system. Whether true or not, the perception was that when you got on the line, you didn't worry about being able to finish the call. It appears that datacomm users may have been divested of such confidence. (15)

Extent of Voice/Data Communications Integration

No activity	69%
Moderate activity	26%
Extensive activity	3%
Have already completed	1%
No answer	1%

Role in the Specification or Purchase of Data Communications Equipment and Services

Advise and consult	69%
Determine the need	74%
Recommend type of equipment or supplier	64%
Specify type of equipment or supplier	54%
Approve the purchase	40%
Not involved	4%
Base	889

Who Has Responsibility for Data Communications

Data processing manager	44%
Director of information systems	31%
Data communications manager	10%
Other	18%
Base	887

Person to Whom Data Communications Manager Reports

Director of information systems	46%
Data processing manager	23%
Other	31%
Base	80